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GARDEN AND FOREST

A JOURNAL OF HORTICULTURE LANDSCAPE ART AND FORESTRY

DECEMBER 2 1891

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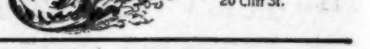

Garden and Forest.

Among the contents of next week's issue (No. 198) will be the following articles:

The Protective Value of Mountain Forests.
Editorial.

The Körner Oak. (With illustration.)
By Dr. R. H. Lamborn.

Shrubs with Late Persisting Leaves.
By J. G. Jack.

Hypericum Buckleyi. (With figure.)
By Professor Sargent.

The paper will contain an illustration of the Körner Oak, from a photograph, and one of Hypericum Buckleyi, from a drawing by Mr. C. E. Faxon.

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TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—The Manzanita. (With figure.) 565
The Dedham Oak in Massachusetts 565
New England Parks . . . . . *Mrs. J. H. Robbins.* 566
Late Persisting Leaves on Trees . . . . . *J. G. Jack.* 567
The Colors of Flowers.—I . . . . . *E. Williams Hervey.* 568
NEW OR LITTLE-KNOWN PLANTS:—Rosa Wichuraiana. (With figure.) . . . . *C. S. S.* 570
FOREIGN CORRESPONDENCE:—London Letter . . . . . *W. Watson.* 570
CULTURAL DEPARTMENT:—Notes on Small Fruits . . . . . *E. Williams.* 572
Apples in 1891 . . . . . *E. P. Powell.* 572
Carnations . . . . . *T. D. Hatfield.* 572
Eulalia gracillima univittata, Dahlia imperialis, Montbretias (Tritonias), *E. O. Orpet.* 573
Galanthus Octobrensis . . . . . *J. N. Gerard.* 573
CORRESPONDENCE:—What are the Experiment Stations Doing for Forestry? *N. H. Egleston.* 574
Winter Weather in North Carolina . . . . . *Professor W. F. Massey.* 574
The Paulownia in Kansas . . . . . *S. C. Mason.* 575
Winchell and Green Mountain . . . . . *Professor W. F. Massey.* 575
NOTES 575
ILLUSTRATIONS:—Rosa Wichuraiana, Fig. 89 569
A Manzanita Tree (*Arctostaphylos Manzanita*), Fig. 90 571

The Manzanita.

EVERY one at all familiar with the flora of the eastern states knows the Bearberry, a delicate plant which often covers rocky and sandy soil with a dense carpet of long prostrate stems clothed with small, thick, dark green evergreen foliage, and which in early spring covers itself with clusters of handsome flesh-colored flowers, in general form not unlike those of the Blueberries. These are followed in the autumn by red fruit which resembles that of the Cranberry, although it is smaller, less brilliantly colored, and of insipid flavor. This plant is the type of the genus Arctostaphylos, and botanists call it *Arctostaphylos Uva-ursi*. It grows in America from the mountains of Pennsylvania to the Arctic Circle, in the Rocky Mountains, on the Pacific side of the continent as far south as northern California, and in the mountains and boreal regions of Europe and Asia. There is another species of Bearberry which occurs on the alpine summits of the New England mountains and in British America. This second species is also circumpolar in its distribution, so that eastern America possesses no endemic representative of the genus, which, although our two species are beautiful plants, makes no great display here, and does not form a conspicuous type of our vegetation. West of the summit of the Sierra Nevada, the Bearberries, or Manzanitas, as they are always called in California, are so abundant, both in species and in the number of individual plants, that they are a feature of California vegetation, often beautiful in itself, and quite unlike anything seen in other parts of the country.

There are ten or eleven species of Manzanitas found in California; some are small and some are tall wide-branched shrubs; and one species, at least, under favorable conditions, attains the size and habit of a small tree. This is the plant to which the late Dr. Parry, who studied the Manzanitas for many years, and knew them better than any one else, gave the name of *Arctostaphylos Manzanita*. Like most of the species, and like their near relatives, the Madronas, the bark of this plant is smooth and bright red even on the small branches. One of the peculiarities of all the species is that the bark is renewed every year; in May or June, when the annual growth begins and the branches swell, the outer layer of the bark formed the previous year breaks into large loose flakes, which gradually fall and display the pale green new bark, which on exposure to the light soon turns red. It is the smooth red trunk and branches which make the California Manzanitas such peculiar and striking objects, and which excite the astonishment of travelers from other parts of the world. The leaves are ample, obtuse, bright green, and, like those of many of the species, appear vertical on the branches by the twisting of the stalks, a provision of nature by which many shrubs in dry arid regions are saved from unnecessary evaporation. *Arctostaphylos Manzanita* is one of the earliest of the family to flower, and it is not unusual to see it covered with its clusters of white bell-shaped blossoms at Christmas-time, although at high elevations the flowers do not appear before the month of May. It is a widely distributed plant, and there is still much to learn of its distribution and of that of several of the other species; but it is known to be abundant along the foot-hills of the Coast ranges north of the Bay of San Francisco and in the valley of the Sacramento, extending up the western slope and probably across the Sierra Nevada. At high elevations it is a low shrub; on the dry barren slopes of the foot-hills it is a tall, wide-branching, usually rather sprawling, shrub, but in favorable situations, where the soil is rich and water is near at hand, it occasionally attains the size and habit of a small tree. Such a specimen is represented in our illustration on page 571. It is believed to be one of the largest, if not the largest, Manzanita in existence. This wonderful plant is thirty-five feet high, and the branches spread out in one direction to a diameter of thirty feet, and in the other to thirty-six feet; but the thickness of the short trunk is more remarkable even than the spread of the crown. At the ground it girths eleven and a half feet. This size is maintained up to the division, which takes place two and a half feet above the surface of the soil, while the two principal branches at their point of separation each girt a little more than seven feet. This tree is growing on the estate of Tiburcio Parrott, Esq., in St. Helena, Napa County, to whom we are indebted for the use of the negative from which our illustration has been made. It stands near a spring in deep rich loam, and close by may be seen other specimens with stout trunks, several of which girt at least six or seven feet.

A happy chance has preserved this giant of its race which represents, no doubt, the growth of centuries, for the Manzanitas are usually slow-growing plants. The great scar of the wound made by an axe on its trunk shows how near it once came to death. Years ago a wood-chopper in the employ of the Napa Valley Wood Company had begun to cut it for fuel; a man passing by purchased its life by the payment of two dollars, and so saved a plant which is, in its way, as interesting as any of the great trees of California, and in doing so earned the gratitude of every lover of trees not only in California but in all the civilized world. It was Dr. C. M. Hitchcock who did this good deed. If he is still alive he has perhaps forgotten all about the great Manzanita and the two dollars which he gave to ransom its life. But his connection with it must not be forgotten, and we should like to see placed on the tree a tablet which should recite its history. The preservation of such trees is a matter of public congratulation, and the memory of the men or women who preserve them may well be kept green as an example worthy of imitation by all broad-minded and intelligent people.

OUR readers remember, perhaps, the portrait of the Red Oak which appeared two months ago in this journal. It represented a tree growing in Dedham, Massachusetts, one of the finest of its race in New England. This tree also owes its life, a correspondent now informs us, to the timely appeal of a man who appreciated its value. This

was Thomas Motley, the father of the historian, whose country-place joined the land on which it stands. It had been doomed to swell its owner's wood-pile, but Mr. Motley gave him ten dollars, and the Oak was spared. This wise action of a public-spirited man deserves to be generally known, and some public record of the fact should be made, so that every one who passes by the tree may be moved to follow so good an example. No one can see this great tree without being impressed by its grandeur and charmed by its beauty, and every one who knows the story of its rescue will feel more profoundly grateful that it is still standing.

The Dedham Oak now belongs to a rich man, a lover of nature and of trees. He can earn the gratitude of all other lovers of nature if he will cause to be placed on it some permanent memorial of its danger and its deliverance. The love of trees and the veneration for those which have attained great age or unusual size is not a distinctively American trait. It is one, however, which every lover of his country should encourage, and for this reason the action of Dr. Hitchcock in saving the great Manzanita in California, and of Mr. Thomas Motley in saving the great Oak in Massachusetts, deserve to be placed on record as worthy examples which others would do well to emulate.

New England Parks.

FOREST PARK, SPRINGFIELD, MASSACHUSETTS.

THE Connecticut valley is a region of beauty. As the traveler from the east comes toward it by rail, he is escorted part way on his journey by that lovely tributary of the Connecticut, the Chicopee, whose low bordering hills lead up gradually to the bolder slopes of the Holyoke range, with its fine commanding peaks and strongly marked outline, rising abruptly from the shores of the greater river.

In the month of July these heavily wooded slopes are golden with Chestnut-blooms, and at all seasons the wealth of forest-growth is apparent on the hills and in the rich, well-watered bottom-lands, through which flow numerous minor streams to swell the winding, stately river which is the pride of all central New England.

The town of Springfield is most delightfully situated, its business portion lying along the river-level and its dwellings climbing the hill to point above point, from which the outlook grows more and more commanding as you ascend, until the wide beautiful valley unrolls before the beholder with its imposing stream curving grandly at his feet.

In a boat at sunset, drifting under the great bridges, and looking up at the steep rocky shores from the level of the river, one feels regret that a boulevard could not have been planned along the brink of the stream for the greater enjoyment of the view, but on the heights there are fine outlooks from which the whole scene can be contemplated, and there is perhaps none finer than that from the estate of Mr. E. H. Barney, which is ultimately to form, perhaps, the most attractive portion of that noble pleasure-ground which the public spirit of certain citizens of Springfield has provided for its people.

Forest Park is comparatively a new acquisition of the city, but as many as twenty years ago the picturesque value of the locality was recognized by some of the inhabitants, and Mr. O. H. Greenleaf, Mr. George Hathaway and the late Mr. Samuel Bowles, editor of the *Springfield Republican*, purchased a tract of land in this region with an idea of reserving a part of it for a park and dividing the rest into building lots. Much of this property came ultimately into the hands of Mr. Greenleaf, who having, during his travels in Europe, become interested in places of recreation for the people, conceived the generous idea of giving it to the town, and accordingly in 1883 presented the city with a deed of seventy acres, with a request that it should be made into a public park. This included a boggy meadow bordered by ravines and some open fields edged with woods. The same year twenty more acres were acquired by purchase, which furnished the city with a tract of ninety acres, which it began forthwith to improve and utilize.

Slowly a sense of the importance of the acquisition dawned upon the inhabitants of Springfield. For a long time the appropriations for clearing and grading were made grudgingly, and the representations by the commissioners of the importance of buying more land were disregarded. The work was put in charge of Mr. Justin Sackett, a local landscape-gardener, who, without any definite plan, proceeded to free the land from rubbish, build the roads and drain the marsh, so far as the limited funds at his command would admit. Thanks to his judgment and sense of the picturesque, as well as to the conformation of the soil, the results of this happy-go-lucky, piecemeal method have proved much more satisfactory and pleasing than might have been expected from an unstudied scheme; and when, in 1890, the establishment of an electric railway brought the Springfield world easily to the gates of the park, everybody was full of enthusiasm and astonishment at the beauty of the spot.

The result was an appropriation for the purchase of some adjoining property, and the building of a Shelter at the entrance. During the past year 250 acres have been added to the park, partly by purchase and largely by gifts from other public-spirited citizens. The most notable acquisition is the fine estate of Mr. E. H. Barney, consisting of about 110 acres, in which he retains merely a life-estate, leaving the whole of it, including the homestead and other buildings, to pass to the city ultimately, as a memorial to his only son.

The city thus has come into possession of a well-watered and well-wooded region of nearly four hundred acres of extraordinary variety of surface and unusual natural beauty.

At the entrance, which is approached by the electric railway, the ground is level, and a wide grassy space is encircled by fine trees, among which the drives wind in leisurely curves, giving attractive views of distant hills, and sweeping aside here and there to spare some monarch of the forest. Two Pines thus left form a very noble feature near the entrance. After leaving this part of the grounds you reach a series of ravines, wooded and hung with ferns from top to bottom, around whose natural curves the path winds in a succession of undulations. These ravines consist of a subsoil of clay covered with about six feet of sand, which shifting surface, washed by the spring rains into charming hollows, is the cause of the fern-hung dingles which so delightfully diversify the park. Winding down the side of one of these declivities by a steep road, too steep for the comfort of pedestrians, you come to a long stretch of green meadow, a valley between two ranges of irregular hillocks, through which flows a little stream, the drainage of the former marsh.

This stream, dammed at intervals, forms a series of ponds, with many cascades, and a rivulet, which add to the beauty of the charming scene. The undulations of the steep little hills, covered with trees of all kinds, growing with that luxuriance peculiar to this region, the soft unbroken turf stretching beside the level, shaded drive-way, the wandering brook, the two ponds with their floating birds and tiny island, the long vista, down which one looks to more dark ravines crowned with magnificent Chestnuts, with Oaks, Maples and Poplars, and numerous other varieties of native trees, make a scene of park-like beauty, peaceful and joyous, suggestive of recreation and delight.

Pursuing your way down this long valley, with unexplored wealth of forest on the left, you ascend the heights once more at the other end, and, after some driving, come to an elevation from which there is an unrivaled view of the Connecticut valley, with the town nestling in a great curve of the river, and behind it the striking range of mountains, Mount Tom and Mount Holyoke, rising blue and imposing against the sky, with their attendant hills in jagged outline behind their two lofty peaks.

A little lower down is the Barney estate, which also commands a very beautiful view of the river, the mountains and the town, with its spires and bridges, and here there will, in the future, be a water access to the park, so that a line of little steamers can ply back and forth between the city and its pleasure-ground, giving a delightful means of access to its coolness and shade. This very beautiful view, combining the human interest of the town with the charm of the majestic river winding royally through its fertile valley, and the imposing group of purple peaks meeting into a cloudy background with forms that reproduce the outlines of the mountains, until one can imagine range upon range behind the Holyoke hills, is inexhaustible in attractiveness, and appeals to every taste. To me the touch of humanity in the picture gives it a final charm. Without those clustered towers and chimneys, with their light overhanging smoke to soften unsightly outlines into misty grace, the deepest tone would be lacking in this fine harmony, the human note being ever the richest and most penetrating, even as a clear voice is heard above an orchestra.

This part of the park rejoices in a wide brook, the Pecowsic, a stony-bedded brawling stream, once so dark and densely wooded as to be thickly stocked with trout. Its bed has been widened, and in places enlarged into shallow ponds, where

grow numberless varieties of Nymphæa and Lotus, and even the great salver-like leaves of the *Victoria Regia*.

The Lotus-roots live all winter under seventeen inches of ice, and send up their tall stems and great white and rose-colored and blue blossoms in wild profusion. Here the Water-lilies show all the varieties of color of which this charming flower is capable, even yellow blossoms mixing with the white and pink and blue ones.

Mr. Barney has interested himself largely in trees and shrubs, and the many varieties of valuable specimens that he has collected will in years to come help the landscape-gardeners of the park to new and interesting effects. He has planted numerous rare evergreens, and has large nurseries for the propagation of different arborescent and herbaceous plants, which, as time passes, will multiply so as to be of service in future decoration of other parts of the grounds, when formal gardening shall have entered into the scheme, thus making generous provision for generations to come as well as gratifying his own taste.

The land all about and in the town of Springfield lies with the same peculiar picturesqueness in these curious hills and vales caused by some long-spent tide, hinting of other ages, and a still more magnificent river, the ice of which may have ground out these lovely curves and modeled these varying surfaces through untold bygone years.

Long ago the green valley of Forest Park must have been a water-course, flowing between those high wooded banks to swell the mighty flood of that primeval river. What changes it has known, from the time when the receding tide left it to swampy solitude till the care of man reclaimed it from picturesque desolation to its present cultivated beauty!

One fault I must find with the management of the little stream that drains the former marsh, and that is, that in portions of its career it is so straight as to resemble a canal rather than a natural stream. This is a fault most easily remedied by widening and curving the channel at intervals, and introducing some large rocks, over and around which the water might tumble and meander with more seeming naturalness. It is ungracious to criticise where there is so much already to delight the eye, but Forest Park is not a completed work of art, and is still open to suggestions as the labor progresses.

With its unrivaled natural advantages, the luxuriance of its vegetation, its diversified surface and its glorious points of view, there is no reason that the artistic sense of many landscape-architects should not contribute to the entire development of its extraordinary natural beauties to their best advantage. Its miles of as yet untouched surface can be treated in new and charming ways, for there is scarcely any limit to the surprises which it possesses and the artistic use that can be made of them.

Year by year new acres will be added to its already magnificent extent, affording fresh outlooks on the noble river and its attendant mountains. The little streams that now drip from its rocks into natural basins, to satisfy the thirst of the pedestrian, can be utilized in many a graceful fashion. The rustic pavilions that already afford agreeable shelter to its visitors will be multiplied in yet more charming forms, without detracting from the general effect. There is room enough for wild and undisturbed forest, and for pleasure-grounds to satisfy the requirements of an urban population constantly increasing.

The admirable generosity of the citizens is not to end here, and as time goes on the men of Springfield will rejoice in adding to their beautiful pleasure-ground such architectural and sculpturesque decorations as seem appropriate to its development. The haphazard arrangement which has proved so popular in Mr. Sackett's hands will probably, as the park's resources increase, be supplemented by careful planning of the yet untouched portions of the grounds, and new combinations will be formed to give added interest and variety to the endless drives and walks, and less abruptness to their slopes.

Not more than one-fifth of its surface has as yet been developed, so that it still has enormous possibilities. The trees are very vigorous and healthy, and many of them are of great size. Some of the huge Chestnuts are a hundred feet high, and the groves of tall Hemlocks and Pines are of exceeding beauty. Among them the birds sing and squirrels chatter, and the rabbits sit by the edges of the paths, so tame that they have been known to bite the children who sought to play with them.

The whole aspect of this charming retreat is joyous and attractive. Everything about it suggests recreation and delight, the admixture of wildness and cultivation, the lack of formal gardening, and the sweet rural aspect even of its most carefully tended portions, are gratifying and enjoyable.

The Springfield people may well take pride in the possession of a resort of such unusual and varied beauty, and it is to be hoped that in time they will honor the men to whom they are so largely indebted, by some memorial tribute to their munificence here on the spot which they owe to their wise forethought and admirable beneficence.

It seems, too, as if some name more distinctive and of less common usage might surely be found for so unique a spot as this, a name that would characterize its peculiar features, and separate it in the memory from other pleasure-grounds in other cities where forest-parks abound; and to a spot which, from the numerous aboriginal relics found here, must have been a happy hunting-ground of the red men, some Indian name, significant and melodious, might well be applied, in the syllables of which might be embodied the slopes and streams, the trees and river, which in this lovely park are so rarely and beautifully combined.

Hingham, Mass. *M. C. Robbins.*

Late Persisting Leaves on Trees.

AS the autumn advances and the leaves fall more or less gradually from the different kinds of deciduous trees, it is of interest at the north to note those which have a tendency to hold them the longest. A study of this point might be particularly interesting to people planting trees about residences which are only intended to be occupied until the late autumn, perhaps until the latter part of November.

It is well known that different species of deciduous trees vary very widely in regard to their character for shedding or holding leaves, but no hard-and-fast rule can be applied to any of them, because even different individuals of the same species show a marked variation in this respect.

Such a frequent question as: What species of New England Oak is it which holds its dry leaves until well into the winter, or until the buds start in the spring? may be answered by the statement that it is a habit common to no particular kind, but may occur on individuals of several species and also on other trees besides Oaks. Very often it is an indication of disease, and sometimes we may infer from the circumstance that the wood has not thoroughly matured and the leaves ripened before being unnaturally checked. Almost every practical man must have noticed that the dry leaves cling long to a limb which has been cut off before the end of the growing season.

Of course, in some cases, the late holding of leaves indicates that the plant is likely to prove evergreen in more southern regions. *Magnolia glauca* is a fair example of such a case. In our northern gardens the leaves keep comparatively green and fresh-looking, and persist until very late; but, unless the trees are in exceptionally moist and sheltered situations, the foliage usually disappears before the winter is over.

Other truly deciduous trees at their northern limits appear to have a tendency to hold their leaves late, and it is also noticeable in many trees of a naturally more southern range which have been introduced and found hardy further north.

It is often a peculiarity of our White Oaks (*Quercus alba*), and occasionally of other trees, that the leaves on the shorter, lower branches remain on them in a dry and withered state long after the upper leaves have fallen. The reason for this is not very clear, but it may be that the lower branches, being much shaded, do not mature so well as those above. Young trees, more than old ones, often show a tendency to hold their leaves; and situation sometimes has an influence.

Fruit-trees, as well as shade-trees, share similar peculiarities, although here there is a greater uniformity among the individuals of each variety, brought about by cultivation. The early Astrachan, for example, ripens and loses its leaves many weeks before the American Baldwin, the fruit of which matures late, and which retains a large proportion of its leaves in a comparatively fresh condition through the month of November.

Of the foreign trees which have been introduced, a few are noted for the persistence of their foliage, as compared with allied native species. The English Elms (*Ulmus campestris*) are almost invariably covered with leaves when the American Elms beside them are leafless. The English Oaks grown in this country are also often remarkable for the abundance of fresh-looking foliage which they occasionally retain to the end of November; and the English Hawthorn sometimes retains its verdure better than almost any other of the smaller trees.

Among our native trees the Scarlet and Black Oaks (*Quercus coccinea* and *Q. tinctoria*), the Red Oak (*Q. rubra*) and one or two others hold their leaves quite late, and they remain dark and smooth, without bleaching and twisting as do the leaves of the White Oak.

Our Walnuts (*Juglans*) are notorious for the ease with which they part with their foliage, while, on the other hand, their allies, the Hickories (*Hicoria* or *Carya*), generally hold a considerable quantity of their dead, dry and shriveled leaves with a surprising tenacity through many hard frosts and high winds.

The Beech also holds its leaves later than the majority of trees, and, apparently, there is not so much difference between the indigenous and the European species in their period of falling, although the latter keeps a fresh appearance for a longer time. Young Beeches are, apparently, apt to retain their dry foliage longer than large trees; but any one who has walked through Beech woods in winter cannot have failed to notice numerous cases of both old and young trees retaining a considerable quantity of leaves which had become so bleached that they were almost of as pure a white color as the snow beneath them,

Arnold Arboretum. *J. G. Jack.*

The Colors of Flowers.—I.

TO answer the question, "What is the primitive color of the flowers, and what is the order of progression in 'color-change,' if such there be?" it is not necessary to trace the development of the flower back to primitive times, nor to know whether it was a Buttercup which first unfolded its petals to the sun, or whether it was a Dandelion or something entirely different from either, for the same laws govern the coloration of all flowers, whether they belong to the order *Ranunculaceæ* or not, and whether they are primitive or recent; neither is it important to know whether petals were originally flattened and enlarged stamens or modified leaves. Any one can easily solve the problem for himself by a study of the native wild plants growing by the road-side or in the fields and woods, and even if he should restrict his observation to a few acres about his summer residence in the country that amount of territory would be ample.

Mr. Grant Allen, in his admirable treatise on "The Colors of Flowers," published in London in 1882, concludes that yellow is the primitive color of flowers, and he also takes the ground that petals are altered and modified stamens. He writes as follows: "As the stamens of almost all flowers, certainly of all the oldest and simplest, are yellow, it would seem naturally to follow that the earliest petals would be yellow too." Again: "All flowers, it would seem, were in their earliest form yellow; then some of them became white; after that a few of them grew to be red or purple; and finally a comparatively small number acquired various shades of lilac, mauve, violet or blue." "Petals are, in probability, originally enlarged and flattened stamens."

This opinion is also held by others. The Rev. George Henslow, in the "Origin of Floral Structures," writes: "Again, when we come to Dicotyledons and find the prevailing tint of stamens is the same (yellow) . . . we gather probabilities in support of that view, etc. . . . but why the first color was yellow and why it ever gave place to red or blue is unknown."

There are two methods employed by Nature in the development of colors: one may be called the imperfect or foliar development, the other the normal floral process. In the first, the colors, at least apparently, are evolved directly from the green chlorophyl, as the reds, yellows and purples of autumn leaves, for from some green-colored flowers a rather limited number of dull reds, purples and yellows are produced. The reds and reddish purples are, however, rare, and seen mostly on the scales of involucres, where they are common, also on the spathes of several of the *Araceæ*, as *Symplocarpus fœtidus* and *Arisæma triphyllum* (Jack-in-the-Pulpit), also in Salicornia of our salt-marshes, which turns red in the fall, and in the Castor-oil plant of gardens, which turns a reddish purple in all its parts—leaves, stem and flowers. I do not find a satisfactory example of yellow evolved directly from green among our native plants. It is extremely doubtful if any pure yellow ever immediately succeeds green. This is somewhat surprising when one considers the fact that yellow is one of its component parts. There are, however, some greenish yellow flowers, and these will be considered further on. Among the green native flowers we find *Smilax herbacea*, *S. rotundifolia* and *S. glauca*, central florets of *Aster umbellatus*, *Ampelopsis quinquefolia* and variegated garden varieties, also the garden *Evonymus Seboldianus*, and many smaller, low, degraded plants.

We will now turn our attention to the normal floral method of the development of color, by which all the bright attractive hues of the flowering world are produced, and first take up for inspection *Spiranthes gracilis*, a pretty little plant of the Orchis family, with white flowers spirally disposed at the summit of the scape. The lip is green, fringed around the edges with white, and the other petals are wholly white. A small section of the petals, placed under a magnifying-glass, appears to be colorless and transparent, while the delicate net-work of the tissue glistens like crystal; yet this colorless tissue, in a mass, reflects white. In the same manner a single leaf-like bract of *Monotropa uniflora*, severed from the stem, appears colorless, but two or more placed together, making a greater thickness, reflect a decided white color.

This feature should be especially noted for the reason that, whenever the term colorless is used in this paper, it is not to be taken in its literal sense, but is intended to signify a state of incipient whiteness. Another point to be noted is, that the white color directly succeeds the dark rich green of the lip. In this one plant is found a clue to the solution of a problem which has greatly perplexed botanists, namely, the problem of the priority of color. In *Spiranthes cernua* green has disappeared, the corolla being entirely white. We will now endeavor to demonstrate that the universal law of progression in color, as regards the floral structure, is first from green to white; or, differently stated, Nature, before she begins to paint the more refined and delicate tissue of the petals, by some secret chemical process, completely eliminates the chlorophyl and prepares a perfectly pure and white canvas upon which to essay higher flights of fancy.

The universality of the law that white directly follows green may be demonstrated by the following illustrations, taken from native plants in flower in August and September in south-eastern Massachusetts, from which section also all other illustrations are drawn, excepting an occasional garden-plant, referred to on account of the facility in obtaining it for inspection. By confining our investigation in the main to wild flowers we avoid the complications arising from high cultivation, hybridization, reversion, etc. One should bear in mind, in this investigation, the well-recognized fact that the limb or expanded portion of a petal, and especially the edges of the same, usually are the first to assume the new color; and that where the change of color is not complete the base of the flower, which is least exposed to the light, retains more or less of the primary color.

Examples: *Nymphæa odorata.* Sepals green outside, white inside; petals first partly green, followed directly by white.

Mollugo verticillata. Petals green outside except the edges, which are white; white inside.

Cornus florida. Corolla-like involucre changes from green directly to a brilliant white. This is a large and beautiful flower.

Gnaphalium polycephalum. Bases of the many white involucral scales green.

Hydrangea paniculata. Gardens; marginal flowers green to pure white.

Spiranthes gracilis. Green to pure white.

Bartonia tenella. Base of petal dark green to white.

Daucus Carota. Flowers at first greenish, becoming white, as also the upper half of all the pedicels.

Erechtites hieracifolia. Flowers and tube frequently remaining green, but in many heads the minute corolla becomes pure white, while the tube does not change color.

Habenaria tridentata. Petals light green, becoming white.

Cobea scandens. Gardens; green, seemingly simultaneously to white and purple.

Plantago major and *P. lanceolata.* Green to colorless or faint white.

Cakile Americana. Calyx green, with colorless to white edges, claws colorless or white, limb purple.

Achillea millefolium. Tube and base green, limb white.

Anthemis Cotula. Tube and base green, limb white.

Rhus copalina. Usually green; several shrubs, however, were seen having a considerable number of white flowers, which afterward turned red.

Lilium superbum. Broad base of midribs green, surrounded first by an area nearly white, succeeded upward by many shades of yellow deepening to red. This is interesting in that the whitish region lies between the green and yellow and does not follow yellow.

Heliotrope. Gardens; like preceding, the greenish centre is followed by white, farther up by red or blue-purple.

Chelone glabra. Green to white, the tip remaining slightly green.

Parnassia Caroliniana. White petals show the basal color in the pretty green veining and green color on the outside of the tip.

Polygonum arifolium, P. Hydropiper acre, etc. Sepals green to white.

Solanum nigrum. Bases of white petals green, forming a distinct green eye; stamens green.

Polygala sanguinea and *P. cruciata*. The flowers are inconspicuous; the bracts, the showy part of the flower, change from green to white, and afterward to purple.

Calla Lily. Greenhouses; base green, upper portion white.

Petunias and Four o'clocks of white variety have green tubes.

Mignonette. Gardens; green petals have a beautiful snow-white fringe.

Stock. Gardens; base of white variety green, as also of many other flowers.

Examples might be multiplied indefinitely.

Then, too, the inconspicuous, degraded, weed-like plants, such as our two species of Atriplex, Ambrosia, Amarantus, Acalypha, Ludwigia, Euphorbia, Salicornia, Xanthium, Cuscuta, Urtica, Pilea, Chenopodium, etc., some of which have colored, the development is precisely the same as in the petals and stamens; the outer edge or margin of the green sepals first discharges its chlorophyl, becoming white, which gradually spreads over the surface to a greater or less extent.

This tendency to change to white in the sepals is very common; a complete list, however, would require too much space, and, furthermore, be unnecessary, as a few examples from common plants will suffice for our purpose, namely, Cerastium, Stellaria, Buda, Plantago, *Polygonum aviculare*, Amarantus, Arctium, *Eupatorium perfoliatum* and many other species of the *Compositæ*, etc. Commonly, the color of the sepals, after changing, is the same as the petals, as a white Burdock has the scales of the involucre white, a rose-colored Burdock has the scales rose-colored, etc. Thus every part of the flower first changes from green to white, there being ample evidence to prove that the pollen also is at first white. It has been

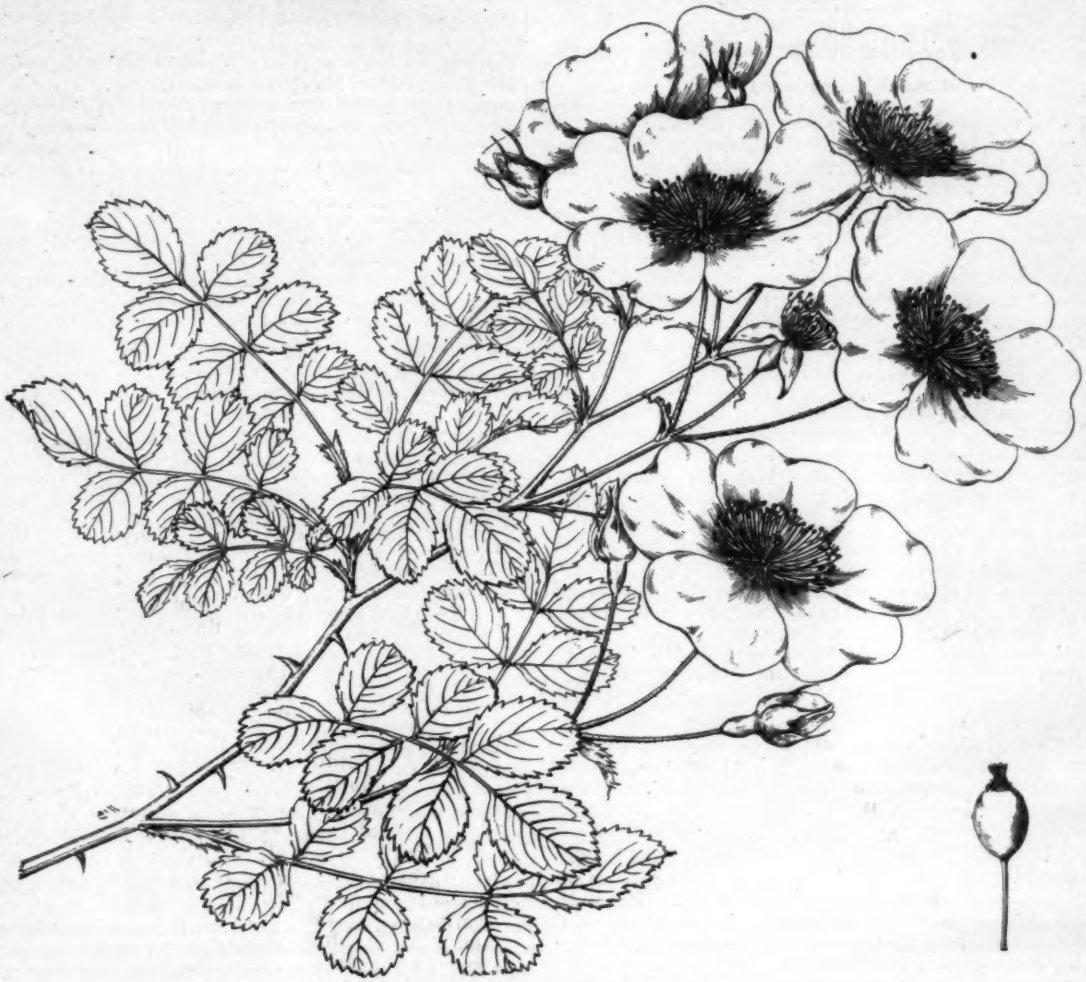

Fig. 89.—Rosa Wichuriana.—See page 570.

no petals, and in which the colors of the flowers generally are scarcely developed, yet give valuable testimony, for in every example the color of the stamens and pistils at least, and often some part of the sepals, begins in precisely the same order, namely, from green to colorless and faint white; indeed, in Pilea, which is monœcious, the fertile flower is green, while the staminate has developed to a conspicuous pure white. The yellowish color of Ambrosia is not in the corolla but in the pollen. The tendency, therefore, of these lowly plants is clearly to white and not to yellow.

The color of the expanded portion of the petal especially attracts the eye, but all parts of the flower, including the calyx, may be colored. As a rule the stamens and styles are colored like the petals, but the anthers frequently are of a different color from the filaments, while the pollen at times differs from both anthers and filaments. When the calyx or involucre is used as an argument for yellow as a primary color that the base of the petal of the Rose was yellow. But every one knows that green is composed of blue and yellow, and as either the one or the other element predominates, so will the tone of green be affected. Not only in the fall, but in early summer, the foliage displays various shades of green, and even a blade of grass of one species will differ in shade from that of another, one being, perhaps, a dark or blue-green, the other a lighter or yellowish green; under these circumstances it is not surprising that, by the eliminating process, a yellowish green, very much thinned down, may be mistaken for a true yellow, especially when the area of color is of the smallest dimensions. The writer has examined many petals of *Rosa Carolina* and is convinced, notwithstanding the smallness of the light-colored base, that the color immediately below the rose or pink is white and below the white a mere vestige of

the original color, namely, a yellowish green, and this is in exact accordance with the principles laid down in this article. Concerning the list of wholly green flowers near the commencement of this paper it is not necessary to consider the question of degradation or retrogression from brighter hues, the simple fact being that there are such flowers, and that when they change color, as they frequently do, it is always to white. Examples: Erechtites and Rhus.

All wholly white flowers, except where the transition could be observed, of course, would be of no avail in our researches, and so are not referred to. Without a single exception every flower that came to hand of a white color was developed directly from green, without any intervening color. The proof is overwhelming that white immediately follows green and is the primitive color, unless it can equally be proved that some other color also directly succeeds green.

New Bedford, Mass. *E. Williams Hervey.*

New or Little-known Plants.

Rosa Wichuraiana.

THE handsome Rose which is figured on page 569 was sent to the Arboretum by Mr. Louis Späth, of Berlin, in 1888 as *Rosa bracteata*, but when it flowered two years later it was found to be the *Rosa Wichuraiana* of Crépin,* a native of Japan, and previously confounded with *Rosa Luciæ* of that country, and still earlier with *Rosa sempervirens*.

Rosa Wichuraiana is remarkable in producing slender prostrate stems, which grow ten to fifteen feet long in a single season, and cover the ground as with a dense mat; they are free of prickles and produce short, stout, straight or slightly recurved spines, and in moist ground develop rootlets freely. The leaves are three to nine-foliolate, with obovate or nearly orbicular blunt leaflets, which are sharply and coarsely serrate, glabrous, very dark green and lustrous, and from a third to two-thirds of an inch long. The stipules are adnate, usually conspicuously toothed, and vary from a third to half an inch in length. The flowers are produced here in great profusion from about the 8th to the end of the month of July, and during the remainder of the season appear irregularly and less abundantly; they are pure white, an inch and a half to two inches across, very fragrant, and are borne in short, broad, pyramidal, terminal, few or many-flowered clusters. The primary bracts are lanceolate, foliaceous, dentate and persistent. The pedicels are stout, an inch long, slightly glandular-hispid, and furnished with lanceolate, denticulate, rather persistent, bractlets. The flower-buds are a third of an inch long, ovoid and abruptly contracted into short points. The sepals are oval, contracted at the apex into rather rigid points, coated with pale pubescence on the inner surface and reflexed at maturity. The petals are broadly obovate, slightly emarginate at the apex, and sometimes rather remotely dentate toward the base. The stamens are bright golden-yellow and very conspicuous; and the column of styles is elongated, rather thick, and pubescent. The fruit is oval or obovate, dull red, and from a third to half an inch long. It matures here late in the season, producing good seed every year.

Rosa Wichuraiana has been used very largely during the last two years by the Park Department of the city of Boston, especially in Franklin Park, for covering rocky slopes, embankments and such spots as it was desirable to clothe quickly with verdure. It appears to be admirably suited for such purposes, and as it grows more rapidly than almost any other vine which has been tried in similar situations, soon making a dense mat over the ground, it seems destined to become a popular plant. Its remarkable habit, its hardiness, the brilliancy of its lustrous foliage, and the beauty of its flowers, which appear when most shrubs are out of bloom, certainly recommend it to the attention of the lovers of hardy plants. *C. S. S.*

* *Bull. Bot. Soc. Roy. Belg.*, xxv., pt. ii., 189; J. G. Jack, Garden and Forest, iv., 44.

Foreign Correspondence.

London Letter.

Chrysanthemums.—The great annual exhibition of the National Chrysanthemum Society has been held this week in the Royal Aquarium, at Westminster. The plants and cut blooms shown were on the whole of the finest quality, and almost every class was abundantly filled. I did not see any very striking new variety among those shown for the first time, Louis Bœhmer being, perhaps, the most remarkable of these. As a flower, this variety has little to recommend it, ugliness of form and dullness of color characterizing all the blooms shown here; but as a wonderful development from the original Chrysanthemum it has much interest. There were about 500 varieties submitted to the Committee of Certificates, but only the following obtained awards:

Comte de Galbert (Calvat), Japanese, with large, full, pale flesh-colored flowers; Lord Brooke (Carter & Co.), a large bright orange-colored incurved Japanese variety; Miss L. Allen (Pitcher & Manda), Japanese, incurved; Delaware (Pitcher & Manda), Anemone, large-flowered, with white ray-petals and a yellow centre; Excelsior (Owen), Japanese, very large, colored bright cerise, with white reverse; Mrs. G. C. Schwabe (Owen), Japanese, pale rose and salmon, tipped with gold; Mrs. R. King (Owen), incurved, a good bold flower, full, and colored rich yellow; Florence Davis (Davis), Japanese, a very pretty white-flowered variety, with long elegantly twisted petals; Kate Mursell (Mursell), a pure white sport from Lady Trevor Lawrence; Coronet (Mursell), Japanese, incurved, large, full, deep yellow, a first-class variety; Louis Bœhmer—some very large well-formed flowers of this were exhibited, and obtained a certificate.

Perhaps the most interesting feature of the exhibition was the collection of flowers of Anemone-flowered varieties. The improvement made in this section of Chrysanthemums in the last few years is most marked. Some of the newer varieties have almost entirely lost the character of *Compositæ*, the ray florets being reduced to a single row, while the disk-florets are so large and well formed as to appear like a bunch of Erica-flowers, say, of *E. ventricosa*. Enormous crowds visited the Aquarium during the three days on which the exhibition was held. Certainly this is the most popular flower-show held in London, though not the most select.

Chrysanthemum Sports.—A paper upon this subject was read by Professor Henslow, F. L. S., at the conference of the National Chrysanthemum Society, held on the opening day of the exhibition. Professor Henslow has for many years been identified with studies of plant phenomena as revealed by horticultural art, therefore anything he may have to say upon such a subject as sporting in plants is deserving of attention. He confessed to being unable to explain this peculiarity of cultivated plants, but suggested that ingredients in the soil had something to do with it. He also pointed to the occurrence of sports simultaneously at various places at the same time as indicating that climatal conditions had some influence in causing a plant to sport. From the fact that "nearly all the early imported varieties from China were much more inclined to sport than those raised from seeds in Europe" it is supposed that sporting may be induced by frequently introducing plants from as different a climate as possible from our own. The most remarkable case of sporting is that of Queen of England, a pale blush variety which has sported into six different colors, namely, two golds, two bronzes, a rose and a primrose. It is possible that, by careful observation and experiment, the exact causes to which sporting is due may be discovered, and the production of new varieties in this way be under the cultivators' control. At present we only know that sports do occur, but when or in what form they will come we have absolutely no means of knowing. Varieties of Chrysanthemums are so easily

obtained from seeds that new and promising sorts are now raised in great numbers, as shown by the number put forward for certificates. Some time ago it was hinted that the crossing of different kinds of Chrysanthemums with each other was easily done, and would be demonstrated by an American grower. I am doubtful whether any trustworthy instance of an actually cross-bred Chrysanthemum can be pointed to. One may guess that a seedling bears the characters of two given sorts, but that, of course, proves nothing.

[The Chrysanthemum is, without doubt, a difficult plant to cross-fertilize. It is not difficult, however, to emasculate a few of the outside rows of florets and fertilize them with foreign pollen. If the central florets are then treated with some solution of gum, which will prevent the development of seed in them, it is reasonable to conclude that we know the parentage of the seeds which are produced. When the resulting plants show evident traces of the blood of both parents our conclusions have this additional confirmation.—ED.]

GERBERA JAMESONI.—Although flowered at Kew two years ago and figured in several periodicals, this pretty Cape Composite is unknown in horticulture. A specimen of it was shown this week at the meeting of the Royal Horticultural Society, and obtained a first-class certificate. It is a stemless plant, with leaves not unlike those of the Dandelion, but more leathery in texture, and nearly erect. The scape is erect, a foot long, bearing a nodding inflorescence as large as that of *Rudbeckia Newmanni*, its color being a rich orange-scarlet. The plant is almost hardy, having stood outside all winter both at Cambridge and Kew. Its scarcity is owing to its failure to ripen seeds in England and to the slowness of growth in its fleshy rhizome, which forbids division. At Kew it has proved a good pot-plant for the greenhouse.

NERINE PANCRATIOIDES, Baker.—This is a distinct and pretty plant, and will, no doubt, prove valuable to the hybridizer, Nerines being very mobile in the hands of plant-breeders. It differs from all other Nerines in having small projecting teeth between the filaments of the stamens, so that it has almost a distinct corona, a character which is indicated in the specific name. The flowers are otherwise not unlike those of *N. pudica*, but slightly smaller. They are pure white, with uncrisped segments, and are produced in umbels of from twelve to twenty flowers upon a scape two feet long. The leaves are produced at the same time as the flowers, and are narrow, nearly terete, and about a foot long. Mr. J. O'Brien has recently introduced this species from Natal. A description of it is published in the *Gardeners' Chronicle* this week.

DENDROBIUM LEEANUM, Sander.—A plant of this in flower obtained a first-class certificate this week. It was imported by Messrs. Sander & Co. along with *D. Phalænopsis*, to which it bears a close resemblance in the character of its pseudo-bulbs and in habit. The inflorescence, however, is more like that of *D. superbiens*, but the flowers differ from this in being white, shaded with pale mauve on the sepals, with a deeper shade of mauve on the petals and labellum.

PHAJUS MACULATO × GRANDIFOLIUS.—This is a hybrid raised from the two species named by Messrs. J. Veitch & Sons. It has the habit and robustness of growth of *P. grandifolius*, to which there is also a resemblance in the size and form of the flowers, their color being soft primrose-yellow, tinged with brown, the front of the lip deep chestnut, and curled in as in *P. maculatus*. It obtained a first-class certificate.

DENDROBIUM PHALÆNOPSIS.—The recently imported plants of this Australian Dendrobe have not been long in revealing their true character, there being some hundred and fifty

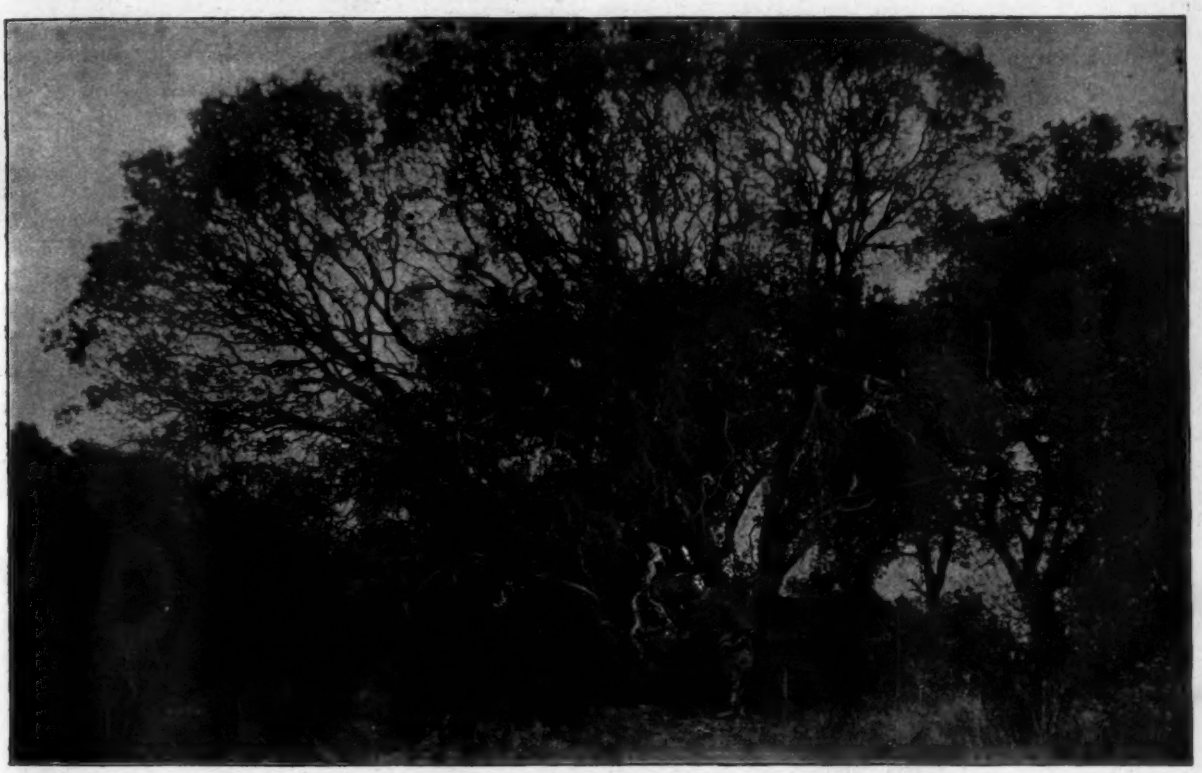

Fig. 90.—A Manzanita Tree (*Arctostaphylos Manzanita*).—See page 565.

spikes of flowers expanded on the plants now in the St. Albans nursery. There are no less than fifteen fine flowers on one spike; another has pure white flowers, others pale rose, and so on to the deep crimson of the variety known as *Schræderianum*.

Vanda cœrulea.—Large importations of this Vanda have recently reached England, chiefly through Messrs. Low & Co. and Sander & Co. Many of the plants arrived in perfect health, having scarcely lost a leaf on the way. The treatment required by Orchids of even the most delicate constitution during transport is now so thoroughly understood by experienced importers of Orchids that many plants, which previously reached England with scarcely any life left in them, are now brought long distances over land and sea without much loss of vitality. As an instance of this I may point to a plant of *V. cœrulea*, imported last year, and flowered lately in Lord Rothschild's collection. It was one plant, not a made-up specimen, and it bore seventeen flower-spikes with over two hundred flowers, all opened together.

London. *W. Watson.*

Cultural Department.

Notes on Small Fruits.

ALLOW me to make a few observations upon Mr. Hunn's "Small-fruit Notes" in your issue of November 11th. I have not found Carman any earlier or better than Souhegan. Lovett's Early and Brackett's 101 fruited with me this season for the first time, but the drought was so severe I defer an opinion of them till another season. I fear they will prove an easy prey to anthracnose, like all the Black Cap family. I think No. 101 will be nearly equal to Gregg in size, more hardy and of better quality, but not as sweet as Palmer. Schaffer, for size and productiveness, beats them all; but it is not hardy here, and suffers badly from anthracnose.

A few years ago I was one of a club to purchase 10,000 or more of Quinby's Favorite Raspberry. Investigation as to its origin resulted, in the statement of the party furnishing the plants, that it came to him in a lot of Cuthberts, and proved so superior to them that he was rooting the latter all out and planting all his spare ground to the new foundling. He said that he knew nothing of its origin, and cared less; that it would not increase its value a particle to know its parentage, etc. When the plants fruited a small proportion proved to be Cuthberts, or, at least, so nearly identical with the Cuthberts I had that I could not detect the slightest difference, and the remainder of the plants, fully two-thirds, if not more, were of feebler growth, and produced a much smaller roundish berry, many of which were imperfect and inclined to crumble. After gathering three or four crops I became disgusted with the whole patch and tore them out. As far as I have learned, the venture with other members of the club met the same fate. I have never seen any mention of the variety since, till Mr. Hunn's article met my eye. I had never made any report on it, and should not now but for Mr. Hunn's note. He says: "It resembles in a marked degree Cuthbert, both in growth of canes and the questionable habit of growing a large number of suckers; in flavor it resembles the Cuthbert also." The only difference he marks is that the fruits average larger, are deep red and very firm; but Cuthbert is also deep red and firm. I have repeatedly examined Quinby's Favorite, have picked bushels of them, and am free to say I consider them Cuthberts, and nothing else. If there are two varieties there ought to be some distinguishing features by which they can be recognized. Variation in size may come from soil or cultivation, and firmness may depend on the weather. I should like to hear some further testimony. Perhaps Mr. Hunn's Quinby differs from ours. It is an important matter to have the identity of the plant established.

Erie Blackberry seems to be mixed—some plants giving heavy crops, a whole cluster ripening together; others bearing very lightly, and ripen gradually. They gave us a better crop this season than they ever did, but they differ but little from the Rochelle. They must be carefully picked and thoroughly ripened, or they are too sour; but many persons relish this acidity. The old Dorchester is the only blackberry I ever found that I consider palatable in a fresh state unless fully ripe. This need not be dead-ripe to be good; but, after all, I have never found the berry that outrivaled the Kittatiny, all things considered.

Of Black Currants, the English, Naples and Lee's Prolific differ but little, and are the only ones tried. Beyond a few bushes for those who like them, they are of little value.

Montclair, N. J. *E. Williams.*

Apples in 1891.

Summer Apples.—The Early Harvest, so popular with our fathers, is too far surpassed by recent acquisitions to be worth growing. The Sweet Bough remains our best summer sweet apple. It does not bear as well as formerly, nor are the trees as healthy. All our sweet apples, with the exception of Talman's, are favorites of the codlin moth. Red Astrachan has been overplanted, and is no longer a profitable market sort, but is invaluable for home use. It is an enormous bearer in alternate years. This year it was nearly a dead loss to large growers.

Summer Rose is the most delicious of summer fruits. It is a small apple of exquisite coloring, and overbears. It must be thinned early after setting. It is not valuable for market. Yellow Transparent is one of the Russian apples, of fine quality and great beauty. It bears when very young, and continues a heavy cropper. It must not be too largely planted, as it ripens with too many good rivals. Primate is an apple of which too much cannot easily be said either as to quality, looks or liberal yield. It is of the first class. For table use it is not surpassed at this season. Summer Strawberry; this begins to ripen close after Astrachan, and is not through till October. For a table apple, it is one of the best. I know nothing finer to pick from the tree and eat from hand. It has done admirably this year.

Autumn Apples.—Alexander, one of the Russian fruits, is a fairly good apple every way—large, handsome, prolific. Fall Pippin is a name given to several kinds of apples, but the one entitled to the name is a large, extra fine, very old fruit, yellow and rich. It drops too easily, and is unprofitable every way. But as it ripens in November it is invaluable as a home fruit. Fameuse, or Snow, surpasses all other late fall apples, either for table or market. It is medium-sized, almost entirely red; quite a copy of Jonathan in size and color. It bears enormously and ripens through October and November. It does not rot easily, and, with a few others, fills the breach between fall and winter fruits. Gravenstein is a September apple of the finest quality and best size. It is equally good for table and cooking. It begins to ripen early in September, and holds out till the middle of October.

Porter tallies very well in ripening with Gravenstein. It varies in quality on different trees; is best on old ones. It is a great cropper, and this year thousands of bushels have gone to waste. Autumn Strawberry is a noble apple, of medium size, striped red. It is a first-class dessert fruit, and an excellent cropper. Does rather better in Michigan than here. Harding is a delicious fruit, to which my attention has recently been drawn, just in time to save it from extinction. It is a seedling among the trees planted from seed by Dominie Kirkland, missionary to the Oneidas, and is one of the most admirable table apples I have ever eaten. It has been locally called, sometimes, Kirkland; but that name has gone to another apple. It grows on the farm of Lyman Harding. It is ripe through November, along with Fameuse, and is quite as good and larger.

Clinton, N. Y. *E. P. Powell.*

Carnations.

THREE years ago my employer imported a number of English tree, or winter-blooming Carnations, for the purpose of comparing them with American kinds. The varieties were imported for the best, and, no doubt, they were as good as any grown abroad. We did not find one worth perpetuating, and this was after what seems to have been a fair trial. The plants were imported in the spring, and were evidently layered plants, which had been kept over in a cold frame. As the American method of preparing plants for blooming is very different, I at once began to apply this treatment to them, with the object of testing them along with the ordinary kinds in the greenhouse the following winter. They were planted out with the others in the open ground, and, being stocky plants, made quite large stools. They were housed at the same time as the others, and in every way were subject to the same treatment, but refused to bloom until late in the spring, and consequently were of no value for the purpose for which they were imported. They behaved very much as ordinary summer-blooming, or border Carnations.

I did not, however, consider that this test was fair, and therefore I took "pipings" of these along with the American varie-

ties, determined to subject them to the same conditions all through the season. The result was the same. As, however, a few blooms were of colors we desired, I kept them till last winter, with scarcely better results. I recently visited the greenhouses belonging to Joseph Tailby, of Wellesley, the veteran Carnation raiser and grower, who kindly gave me some valuable information regarding the history and development of the American type of Carnation. When I told him of my experience with the imported varieties, he said the same had generally been his, especially with regard to the English varieties. His opinion is, that the American Carnation, as it is, is the result of adaptation, by selection and acclimatization; and when I suggested to him that the first Carnations came from somewhere, he said that the French varieties had always succeeded better here, and had been the parents of the best American varieties. Boule de Neige, La Purite, Madame Carle, A. Alégatière and De Graw (parent of Mrs. Fisher, perhaps best, new white) are French varieties which are still grown to some extent. The ideal Carnation, in addition to blooming freely, should have solid, erect, pointed foliage, through which air and sunlight can strike the soil. The importance of this will be readily apparent when it is remembered that broad, flat, dense foliage must hold moisture, causing dampness and decay of foliage. Stiff, wiry foot-stalks are another necessity which we too often get with the lack of solidity of bloom, as in the case of Lambourn and Lizzie McGowan, two very pretty whites, which, however, are thin and will not travel. A. Alégatière is one of the best scarlet flowers we have, but the stem is too weak, and, withal, brittle, causing the flowers to droop, and so is fast being displaced by Florence and Hector, American varieties with stiff stems. Grace Wilder, the best and most extensively grown of all rose-colored varieties, was raised by Mr. Tailby. It was a seedling from Boule de Neige (white) × La Purite (rose). Boule de Neige proved an excellent seed-parent, and along with Grace Wilder came some seedlings, giving shades of color, which would be valuable at this time although undesirable then.

A good marketable, winter-blooming yellow variety is a want long felt, but soon to be filled. Among border or summer-blooming varieties we have some excellent yellows, but they almost refuse to bloom in a greenhouse. The French have produced a few doubtful yellows of free habit, but poor constitution and color, and it is on these, with the good border-yellows, that Mr. Tailby has been working. Results were unsatisfactory, and so he, last year, tried Florence (scarlet) with better results, getting good and distinctly intermediate color as a result of the cross, but no clear yellow; still he is satisfied he is on the right road, and thinks by crossing back he will get what he needs. It is a great step, certainly, to get an infusion of yellow and yet retain the free habit of the seed-parent. The crossing of Florence (scarlet) and Anna Webb (deep crimson) has produced an intermediate shade reminding one more than anything of the Chrysanthemum Cullingfordii, having precisely the same velvety texture. But there is something more important than this in this seedling, and that is its excellent habit, for it is far superior to Anna Webb and Ferdinand Mangold, the two prevalent crimsons, in constitution and free-flowering qualities.

Numerous sports have been produced, including white, pale rose, salmon and purple flowers, from Grace Wilder. Lately there was in bloom a salmon-pink sport from Hector, the new scarlet. It is a color which several raisers have been trying to get. All of them, however, have lacked a sufficiently hardy constitution or free-flowering habit to make them worth perpetuating. If this variety holds its color, with the good qualities of Hector, it should prove valuable. Strange to say, however, the habit is different and considered better, being more dwarfed and erect.

There appears to be an established conviction among Carnation-growers that locality has much to do with success or failure in the case of certain varieties. Soil, probably, has more influence than locality. One thing is certain, that Grace Wilder needs a light soil, and Anna Webb and crimsons generally, a heavy one; and here I venture to suggest, that as most marine plants are characterized by glaucous foliage, those varieties, like Anna Webb, having a distinctly glaucous foliage might be improved if a little salt were added to the soil. Wood ashes, containing the salts of potash and iron, ought also to have a beneficial effect.

Wellesley, Mass. *T. D. Hatfield.*

Eulalia gracillima univittata.—This fine ornamental grass should not be confounded with the well-known varieties of *E. Japonica*. The newer plant has been extensively catalogued as *E. univittata*, and the tendency is to associate it mentally with the older kind, and therefore it has not been so widely distributed as it deserves, for it is quite distinct in appearance, and it may be employed in places where the older *E. Japonica* would be quite unsuitable. *E. gracillima* does not exceed four feet in height under the most liberal treatment, and this is one of its most useful characteristics, for it can be used as a centre plant in large vases to the best advantage. Its foliage has a tendency to assume a horizontal position when fully matured, and this, with the white midrib of the leaf, gives the plant a very distinct appearance among ornamental grasses.

Our plants were originally obtained from Monsieur Lemoine, Nancy, from whom so many desirable plants have emanated, but the native country of *E. gracillima* is, without doubt, Japan. It has been described as perfectly hardy in the United States, but this needs confirmation. Perhaps some reader may be able to enlighten us. Our own stock has hitherto been too limited to risk losing it by leaving it out during winter in these colder states, and there is so little trouble involved in lifting the roots and storing them in sand in a cellar that we usually adopt this method and plant them out again in newly enriched soil in spring. According to Bentham and Hooker, we must no longer call our plants Eulalias, the proper name being Miscanthus; but probably the garden name will be Eulalia for a long time.

Dahlia imperialis.—This is at present one of the rarest of Dahlias in cultivation. Why this is so is not easily understood, for there is no other Dahlia so worthy of a place as this species, if space can be given it at this season, in a greenhouse. The word space means a good deal here, for, while two square feet of pot-room is enough for a well-developed specimen, it must have at least eight feet of head-room. Our plants were grown out-of-doors until frost came, when they were about five feet high; they immediately showed flower-buds, while the plants rapidly grew three to four feet higher. The first blooms are now open, and we shall have a succession of them all winter. They are very suitable for cutting, as they last a long time in water. While most other Dahlias have a flat outline, the flowers of the Imperial Dahlia are broadly campanulate, and resemble a Lily much more than a Dahlia in outline, the flowers often measuring eight inches across, and the petals being over an inch across and pure white, except at the base, where they are pink. The anthers and pollen are bright orange, forming a pretty centre to the flowers. *Dahlia imperialis*, in common with most of the other species, is native of Mexico, whence the plants were originally introduced into Europe over a century ago, and were at first grown for the tuberous roots, which were said to be eatable, but they never found much favor with man or beast, owing to their acrid or medicinal flavor. All the species of Dahlia are single, the double varieties being the result of the gardener's art.

Montbretias (Tritonias).—In a recent article in GARDEN AND FOREST Mr. Barker says that, so far as he is aware, *M. crocosmæflora* is the only hybrid in cultivation in the United States. But Mr. Gerard and others have noted on more than one occasion some half dozen others of Monsieur Lemoine's productions, such as Etoile de feu, Bouquet parfait, Drap d'or, Rayon d'or, Tigridie, Transcendant and others, all of which are distinct and equal in merit to the original *M. crocosmæflora*. It is a mistake to treat Montbretias as hardy plants, for they certainly are no more hardy than the Gladiolus here in the eastern states. I have known after a mild winter a few stray bulbs to come up here and there in a feeble sort of way, precisely as do Gladiolus-corms of Monsieur Lemoine's so-called hardy kinds; but there seems to me no sort of reason for risking Montbretias in this way when it is so easy to take them up at the same time that Gladioli are dug, and store them away in a cellar in sand or earth that is moderately damp. To grow these plants well requires a rich soil, the richer the better, hence one of the advantages of transplanting every year to a new position. There are, I know, several others who cultivate the newer kinds. My own were received partly from a correspondent in Oregon and partly from another in Indiana. It would be interesting to have the experience of these western growers.

South Lancaster, Mass. *E. O. Orpet.*

Galanthus Octobrensis.—It was with surprise and delight that I found this autumnal Snowdrop flowering in my border in the middle of November. This was somewhat late for the variety, but as the bulbs were received in early September with some other east European varieties, it speaks much for their precocity that they have bloomed with such a short establishment. It is interesting to speculate on the conditions which, through the course of years, have imparted to a local strain of *G. nivalis* the precocious habit of this variety. Like

the other fall-flowering kinds, *G. Octobrensis* is said to be found only in the Grecian Archipelago—this particular one in Albania—from which it was sent some years since. It has been rare in gardens till lately, when the increasing interest in various forms of the Snowdrop has led to the collection of the hitherto scarcer kinds. This plant seems to have considerable vigor, since the recent hard weather—fifteen degrees of frost with high winds—does not affect it. The danger would seem to be that it would weaken from insufficient ripening. Perhaps a warm covering of leaves later will help it in this.

Snowdrops are always beautiful and dainty, and one welcomes them even at this season, though now there is an unmistakable lack of that sentiment which has endeared this flower to so many and is so associated with their normal early spring-blooming habit. Snowdrops are, even when plentiful, not very striking flowers in the garden, and it will be well when small plots of the varieties are grown to cover the beds with some neat-growing Sedums, or similar plants, to serve as a foil to their fragile loveliness. *G. Meehani* would be a capital plant for the purpose. These autumnal Snowdrops will probably never be useful garden-plants or offensively common.

Elizabeth, N. J. *J. N. Gerard.*

[The specimen sent to this office by Mr. Gerard, and which is, perhaps, the first, or at least among the first, to flower in America, was almost a precise copy of the single Snowdrop which ordinarily blooms in late winter or earliest spring.—Ed.]

Correspondence.

What are the Experiment Stations Doing for Forestry?

To the Editor of Garden and Forest:

Sir,—The twelfth number of the *Experiment Station Record*, completing the second volume, has just come from the press. Its issue has been delayed by the preparation of the very full index and table of contents, embracing more than a hundred pages. The *Record* is composed of abstracts of the annual reports and bulletins of the experiment stations, and the index is, in fact, an index to 42 of the reports and 329 of the bulletins issued during the year 1890 and a part of 1891, and comprises 14,781 printed pages. It becomes, therefore, the ready means of surveying the field of experiment station work and seeing what the fifty stations are practically accomplishing.

I find out of between eight and nine thousand entries of the index there are only five under the words "forest" and "forestry." Under the title Trees there are nine entries relating to forest-trees. Under Insects only two have special connection with timber trees. Under Conifers there is a single entry, referring to some valuable notes on this class of trees by Prof. Popenoc, of the Kansas station, and under Evergreens there are two entries, one referring to a list of trees growing on the grounds of the Oregon station, the other to an account by Professor Keffer of the evergreens in the nurseries of the South Dakota station.

There may be, here and there, in this extended index an entry bearing upon forestry subjects in addition to those now noted, but they must be few. So far as a quite careful examination of the index shows, it appears that only seven out of fifty or more stations have as yet published anything relating to forestry. Some of the stations may have done some experimental forestry work which they have not carried so far as to give results warranting publication. But with all reasonable allowances, does not this official record show a marked neglect, on the part of the stations generally, of a subject which has the closest and most important relation to agriculture?

This neglect seems the more inexcusable when we see the work done by some of the stations. In South Dakota, for example, the station originally established for the whole territory of Dakota—though dating its existence only from 1887—has already done such experimental forestry work as to warrant the publication of four forestry bulletins besides what is published in the annual reports. In the very year of the establishment of the station three acres of ground were planted with tree seeds. In April, 1889, Professor Keffer gave the public the results of this experiment. A statement was made of the kinds of seeds sown, the varying depths at which the seeds were placed in the ground, the per cent. of those that germinated, the influence of deep or shallow planting on germination, the greatest growth of the various kinds of seeds, the method of cultivation, atmospheric conditions, and the general result at the time of publishing the bulletin. An account is then given of the planting, in the spring of 1888, of a forest-tree nursery, comprising 12,000 or more seedlings and embracing thirty species. The method of planting and the subsequent treatment are given, with the results at the time of writing. In November of the same year another forestry bulletin was issued. In this Professor Keffer gives an account of the planting of the seedlings in permanent forest-plats, which was done in the spring of 1889. The situation and character of the ground are given, with a diagram showing the relative location of the various species. The method of planting and the subsequent management are described, and the growth from month to month is tabulated. A third bulletin was issued in January of the present year. This bulletin is a report of progress in lines of work previously recorded in the other bulletins. Analyses of the soil of the experimental plats are given, with observations on the root-growth of transplanted trees, and a discussion of the value of a dense leaf canopy. A list of trees specially valuable for forest-plantations in South Dakota, as shown by observation and information, is also given. Still another bulletin was issued in April of this year. In this the importance of tree-planting is urged, methods of grove, street and lawn planting are discussed, and the advantages of certain varieties of trees for groves, streets or lawns are set forth.

It is impossible to overestimate the value of these forestry bulletins, though no adequate idea of them can be given in this brief space. But the question at once arises, Why are not similar bulletins issued by all or most of the fifty stations, instead of being confined to less than half a dozen? There is not a state in the Union where there is not manifest need for forest-experimentation, though it may not be the same as in Dakota. The forest-crop is the great agricultural crop of the country, most important in itself, as also in its relation to other crops. The problem is confronting us, How shall this crop be maintained in adequate measure when consumption is increasing, while the area of ground occupied by trees is decreasing because of the demands constantly made upon it for tillage purposes? We appropriate $728,000 annually to the experiment stations to aid them, in the language of the act by which they were established, "in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science." The farmers of other treeless states, and of those also where trees abound more or less, may well ask whether the stations established among them are carrying out the full purpose for which they were endowed so liberally, when they fail to give instructions in regard to the uses and management of trees, the kinds adapted to their soil and climate, and the relations of trees to the whole business of agriculture.

Department of Agriculture. *N. H. Egleston.*

Winter Weather in North Carolina.

To the Editor of Garden and Forest:

Sir,—We have just passed through the most sudden and early cold snap I have yet experienced in this locality. The autumn has been continuously dry and sunny, and the cold wave which struck Raleigh on November 16th was the first killing frost we have had. The true temperature was not far from nineteen degrees above zero. Since then we have had sunny and pleasant weather, and I have been much interested in observing the effects of the sudden cold. The day before the frost our late Irish potatoes were still green, and the cold was so intense that it froze many of those which were near the surface. Our beds of Scarlet Geraniums had just taken on new growth from a shower a few days previous, and it is curious to notice that of two beds in the same exposure one had all its plants completely blackened, while the other, not twenty feet away, is scorched all over the top, but still shows green leaves below. In this bed the growth was more dense, and the mass of leaves above protected the lower parts of the plants. Pittosporums do not show a singed leaf. *Gardenia florida*, sheltered by the walls of the college building from the west and north winds, was not hurt at all. Oonshin Oranges, on an exposed hill-top, where the north wind had a full sweep, show no sign of injury. *Agave Americana*, planted on the same lawn, is quite uninjured, and a three-year-old bush of Jerusalem Cherry (*Solanum Pseudo-capsicum*), near by, looks just as happy and full of its scarlet fruit as ever. Olives, of several varieties, received from California last spring and planted for the purpose of testing their endurance of our climate, show no signs of injury. The Tea Roses look worse than anything else,

for the shoots, so red the day before the freeze, are black and drooping now, and the numerous buds are ruined, of course. Our Fig-trees dropped their remaining leaves in a hurry, but no injury to the wood can be seen. A large plant of *Ipomæa Texana*, an erect, tree-like Morning Glory, from the lower Rio Grande, the hardiness of which we are testing outside for the first time, was killed half-way down. It stood in a sheltered place, and was about eight feet high. The lower wood is so hard and ripe that we have strong hopes that the mound of earth we have built around its base will save it.

The extremely dry and sunny autumn had doubtless a great deal to do with the immunity of some things from harm, and the short duration of the cold also should be considered. But this sudden hard frost, coming after such a warm spell, gives me more confidence in the hardiness of the Japan Mandarin Orange, the Oonshin or Satsuma, than any test it has heretofore had. Whether permanently hardy here or not, it seems pretty certain that this variety will move the Orange belt, at least for Mandarins, a long way north of its present limits. Our trees are grafted on the *Citrus trifoliata* stock, which will dwarf them to the size of shrubs rather than trees, and at the same time will make it comparatively easy to give them some protection. We are studying the effects of different modes of protecting half-hardy plants, but with these Orange-trees we prefer to test their hardiness with full exposure.

One Olive-tree, planted on the south-east side of a high board fence, shows a suspicious brownish tinge on the leaves, while the others look as fresh as ever. This is doubtless because the morning sun struck it when frozen. Among other mulching materials, I am trying broken rocks, a little smaller perhaps than good macadamizing metal. As a summer mulch they are admirable; whether they will be of service in protection from frost I am not yet sure about, but in the last short chill the soil did not freeze under them. As a mulch to keep strawberries clean they are first-rate, and I believe hasten the ripening by their rapid absorption of heat by day and radiation at night. Broken flint-rocks are such a plentiful material here that trials are easily made.

In one of our Fig-plantations we have set Pine-bushes all along through the rows upright in the soil. These bushes are a little taller than the Figs, and give the plantation the appearance of a rather thinly set Pine-thicket. Another lot of trees north of these, and on a little higher ground, will have no protection whatever, the object being to try the effect of a light shelter with a free circulation of air. But little will be shown, however, unless the winter is unusually severe, as Figs seldom suffer here, except in hard winters. *Agave Americana* will be tested with full exposure, and also with a shelter to keep water out of the centre.

The behavior of the Pittosporum for the past three years convinces me that this handsome evergreen shrub will prove hardy much farther north than it is generally planted. In the *Gardeners' Monthly* for September, 1876, Mr. Walter Elder writes: "A plant of *Pittosporum Tobira*, four and a half feet high and three feet in diameter, was planted in the open garden of James C. Smith, Esq., 2104 Walnut Street, Philadelphia, in June, 1875. It stood out all last winter without injury, and now, June 5th, 1876, it is in a flourishing condition, covered with sweet-scented blossoms and filling the air with fragrance for a long distance." It would be interesting to know how long this plant survived.

Raleigh, N. C. *W. F. Massey.*

The Paulownia in Kansas.

To the Editor of GARDEN AND FOREST:

Sir,—A spreading tree by the side of the main drive-way in the college grounds here has often attracted the attention of passers by its very large leaves. It is usually taken for some remarkable variety of Catalpa, the resemblance to those trees both in foliage and habit being quite striking. The specimen is a Paulownia, doubtless the most western tree of its kind to be found in the Mississippi valley. It was grown from seed in 1884, and up to 1889 was cut back each spring to the ground, and grown for the rank sprouts which bore enormous broad leaves. In the summer of 1888 one sprout from this root grew to be nine feet high and two and a half inches in diameter. Some of the leaves were nearly two feet broad. In autumn this sprout was cut back to six feet high and wrapped thickly with hay. The winter following being a mild one, it came through without injury, and by the next fall measured four inches in diameter and had made a top growth of seven feet. At present the tree measures twenty-eight inches in circumference and is about eighteen feet high, with a spread of sixteen feet. This is a four-years growth, which it would be hard to find equaled among our native trees.

During the past summer the tree formed its first crop of flower-buds. These are borne in large terminal racemes, and are about the size of a Morello cherry, and have the appearance of being made of thick soft buckskin, so snugly are the embryo blossoms protected from frost by the thick calyx-lobes.

In spite of this care many of the buds were blackened to the heart by a severe frost early in October, and it is very doubtful whether any of them survive the winter.

Kansas Agricultural College. *S. C. Mason.*

Winchell and Green Mountain.

To the Editor of GARDEN AND FOREST:

Sir,—As my note in GARDEN AND FOREST in regard to the similarity of the foliage of the Winchell and Green Mountain Grapes has been extensively copied, it may be proper for me to say that both Ellwanger & Barry and Stephen Hoyt's Sons sent me samples of the grapes which they grew respectively under the above names. If the clusters received from the two firms had been placed side by side and the names removed I should probably have been unable to distinguish them from their appearance. There seemed to be a slight difference in flavor, which may have been caused by different degrees of ripeness or by difference in soils. The vine of Winchell which I have growing did not come from Messrs. Ellwanger & Barry direct, but they have now sent me vines which will be planted for test. Judging from the fruit sent me, if the vines prove as nearly identical as the fruit it will be unfortunate if they go out under two names. We expect to fruit them (or it) next summer and to settle for this section the date of ripening.

So far, the White Diamond is the earliest white grape we have tested. Its clusters are not so compact and handsome as the Winchell or Green Mountain clusters sent us, but the grape is better in quality, and promises to hang on the stem better. A large grower of early grapes in Florida, who was here a few days ago, told us that the Diamond is being largely planted there for early shipment, and he was quite enthusiastic over its quality and productiveness. Grape-growers in the south are rapidly finding out that the Delaware is particularly adapted to sandy lands, and is more exempt from black rot than many others. There is a growing inclination to plant largely of this fine old sort.

Agricultural College, Raleigh, N. C. *W. F. Massey.*

Notes.

The Central Park in this city contains nine miles of drives, five and three-quarter miles of bridle-paths, and twenty-nine and one-half miles of walks.

The house called Claremont, at the end of the Riverside Drive in this city, now used as a restaurant, was occupied long ago by Viscount Courteney, and later by Joseph Bonaparte.

The American Forestry Association will hold a meeting in Washington on December the 29th and 30th. A full attendance of the members is desired, and a strong effort will be made to secure national forest-reservations.

The yield of potatoes to the acre is larger throughout the country than it has been for ten years past, and in some states, according to the Government crop reports, the average for a state is rated as high as 120 to 125 bushels per acre. For the whole country the yield per acre is given at nearly ninety-four bushels.

Chrysanthemum-shows have been successful beyond precedent in England this year, and the same is true of the exhibitions on this side of the water. Before the shows many complaints were heard that the season was unfavorable, but never before were fine blooms displayed in such numbers. Exhibitions were held in a dozen cities, any one of which was superior to the very best in the country a dozen years ago.

In an article on the "Literature of the Garden," published in a late number of the *Gardeners' Magazine*, Mr. F. W. Burbidge, in speaking of John Parkinson's famous "Paradisus Terrestris," says: "I know of no book on gardening and flowers, etc., which possesses quite the delightful old English tone of Parkinson, and, among other remarkable things, this work is famous as containing the first systematic arrangement of Daffodils, or Narcissi, no less than ninety-six species and varieties being illustrated or described in its pages. A modern garden stocked with all the plants of Parkinson's book would be a very good garden, even although it lacked a great many

beautiful flowers introduced since his time—*i. e.*, 271 years ago. It is essentially a book of hardy or open-air flowers and fruits, such as were commonly grown before the days when cheap glass and coal made greenhouses and hot-houses possible."

The sixth annual meeting of the Pennsylvania Forestry Association was held last week in Philadelphia. Addresses were made by Professor Rothrock, Herbert Welsh, John Birkinbine and the Rev. J. P. Lundy, President of the Association. Professor Rothrock offered a resolution, which was unanimously adopted, that the Superintendent of Public Schools in the State of Pennsylvania should recommend that each of the state normal schools should give five lectures every year upon the principles of forestry as related to the public welfare. It was also resolved that a committee should be appointed to consider the advisability of preparing forestry tracts for general circulation, in order to spread a knowledge of the subject as an essential preliminary to any effective legislation.

In the current number of *Meehan's Monthly* it is stated that the Girard estate has been making small forest-plantations in an experimental way to see if it was practicable to grow timber in the coal regions, where nearly every stick has been cut away for props and various other uses connected with mining, so that now almost every piece of plank used there has to be brought from a distance. Eight years ago seedling English Larches and Scotch Pines, one year old, were planted in furrows driven through the underbrush which was growing up where old forests had been cut away. The Larches now average from seventeen to eighteen feet high, and are noticeably healthy. The Larch is a mountain-tree, and thrives in comparatively poor soil, and as these plantings are 1,500 feet above the sea-level the tree has something of its natural conditions. The vigor of the trees shows that they appreciate this position.

Dr. Rudolph Stoll, professor in a pomological school near Vienna, has issued a treatise on "American Early Peaches," illustrated by fourteen colored plates. Peaches of the sort he describes have been cultivated in Europe since the middle of the century, but what he calls "a new epoch in the culture of early Peaches" began in the seventies with the introduction of varieties received from the American grower Hales. These are now very largely grown in the south of France and also in Austria, where the preferred varieties are Amsden, Alexander, Musser and Wilder. "Propagation by means of seeds," says Dr. Stoll, "is as yet certain only with seeds imported from America, as most of the seeds grown in Europe do not come true, and it also seems doubtful whether as early-bearing trees would be produced by European seeds." Propagation by graft is therefore exclusively relied upon in the orchards of Professor Stoll's school. He says that in a climate where the Vine flourishes these Peaches will also flourish either as shrubs or as low trees; that in middle Europe, where Vine-culture is no longer profitable, they will do well on walls facing south, and in more northern countries only on espaliers under glass. The comparative excellence of different varieties as regards flavor he expresses in the following list: Cumberland, Saunders, Amsden, Wilder, Gouverneur Garland, Briggs' May Peach, Waterloo, Musser, Hales' Early, Bowers' Early, Canadian Early and Harper's Early.

The degree to which irrigation must have been practiced by the indigenous tribes of the west, in regions that now have relapsed into a desert condition, is well shown by the station of an Indian "fort" recently discovered about ninety miles below Phœnix, Arizona. The ruins, which are said to be the largest yet found, lie more than four miles distant from the Gila River, and are about a square mile in extent. In the centre is the fort, still very well preserved, and covering about six acres. It is built, says a writer in the St. Louis *Globe-Democrat*, in a very peculiar way. The first of the stories or "tables" of which it consists is about twenty feet in height and "is made of dirt with a wall of boulders laid in cement about the outside. On top of this and of the same height, though only half the size otherwise, is the second table, walled up as the first. On this a smaller one of the same height, and on top of that is the fort proper, constructed of stone and durable. The edges of the tower-tables were used as gardens, and around the walls are hundreds of boulders brought from the river, doubtless for the purpose of casting down on the heads of a foe. In the top fort are many skeletons and human bones, and in all probability the place was besieged and the people died of starvation. A ditch four and one-half miles in length runs by the base of this structure and brought water from the Gila. It is well defined and about thirty feet in width, though it is stopped up and no water runs through it." This immense construction, which was only the central feature of a large settlement, now stands in one of the most desert parts of Arizona, and no one had seen it until it was recently discovered by some miners who had lost their way in the wilderness.

Professor B. D. Halsted concluded a lecture on Injurious Fungi, delivered before the Ohio Horticultural Society, with a suggestion that we should not trust to fungicides alone for the eradication of plant-diseases. He said that healthy plants of strong stock, well fed and not overworked by undue cropping, are the best able to withstand the inroads of enemies of every sort. The half-starved plant is no better able to struggle among the vicissitudes of life than the ill-fed and half-sick man. Blights overcome the one as scurvy does the other. Therefore, the best conditions for the production of profitable crops are the same as those that will most assist in warding off its fungous enemies. Let the seed, soil and surroundings be the best, and a fungicide, so to speak, has already been used when it will do the most good and render the application of others, when needed, all the more profitable. In short, strive to do the best for the fruit-tree or shrub, as such, and a long step will be taken toward overcoming the enemies that break down the weakest hosts first. Having done this we are ready to take up the direct fight of the fungus foes with the long end of the lever. It must be a good, promising crop that will warrant the expense of fungicidal applications, and the larger the promise the greater the profit. Again: When a house or a community is afflicted with some contagious malady, pains are taken that the germs of the disease shall not remain lurking in out-of-the-way places. The carpets, and even wall-paper, are removed and the whole house fumigated or otherwise treated with some germ destroyer. While as thorough a cleansing as this is not possible in orchard, vineyard or garden, there are some measures that could be taken with profit. If weeds are left to mature and scatter their seeds, weeds are expected to follow. In like manner, if all diseased leaves, stems and fruit are allowed to pass the winter undestroyed, we shall reap what we have sown. The burn heap is to be a potent factor in future horticulture. If we continue to scatter the seeds of fungus decay, of that sowing we shall reap corruption.

Mr. Waldo F. Brown writes to the *Country Gentleman* that the Black Locust can be profitably planted for posts, at least in Ohio. He asserts that farms have been sold there at from $20 to $30 an acre, which, if planted in Locust-timber, would yield several hundred dollars an acre in posts within twenty years, and then would make a second harvest quicker than the first grew. He cites an instance of a ten-acre grove which was cut off between 1860 and 1870 and then sold for posts. How much this first cutting brought could not be ascertained, but it was certainly profitable. In just eleven years after the present owner began to sell posts from the second growth, and he has since had a regular income every year. Between 1879 and 1883 he cut 6,608 posts from the ten acres which brought $991, or an average of fifteen cents a post, and ever since then he has cut and sold large quantities. For ten years past this land, which is a steep hill-side unfit for cultivation, has yielded more profit than the remaining ninety level acres of the same farm which have been under cultivation. In another case a row of thirty-three Locust-trees, which had been planted along the north line of a farm for twenty rods, was cut after having grown twenty-five years. The harvest was 400 good posts, worth twenty-five cents each, 600 fence-stakes, worth five cents each, and enough wood to pay for cutting and splitting the posts. From the second growth of this grove the owner has cut all the posts needed to keep the fences on his farm of 150 acres, and he has now 200 posts seasoned for future use. These trees occupy only a quarter of an acre of land. How long one planting of Locust-timber will continue to yield crops no one knows. As soon as a grove is cut off it begins to send up a new crop, which grows rapidly, and will be large enough for post-timber some years sooner than such timber could be grown from seed. Mr. Brown once examined a grove of two acres on which the trees had been cut eleven years before, and found that each stump had thrown up from three to seven sprouts, the largest of which were then being cut. This thinning process went on for several years, until all but one of these sprouts to each stump was cut, and then enough trees were left to make a dense forest. In the thirteenth year after the original cutting 400 posts were cut from two acres.

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